Every man engaged in practical horticulture as his chief vocation, should be a thorough meteorological observer, with a full equipment of the best scientific instruments to be obtained. * * * When the horticulturist is fully equipped and trained as a meteorologist he should then join the corps of voluntary observers connected with the State and National Weather Services, thereby adding his quota to the general fund of knowledge for the benfit of the public.

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But, after all, those who serve the public thus gratuitously are recipients of direct benefit in the form of scientific knowledge, and the satisfaction resulting from serving their State and nation.

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We are just beginning to study some elementary lessons in the costly school of experience; to learn how to retain our vast patrimony of soil fertility and how to handle the rainfall so as to dispose of the surplus and provide for the storage of moisture for occasional seasons of deficiency. The tendency of the climates of all mid-continent regions is toward extremes. The means may be constant through long periods, but the wide departures and sharp reactions are the special features of the climate that test the hardy qualities and vitality of all forms of animal and plant life.

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I have only attempted to suggest some of the possibilities of advancement in this branch of the public service, along these economic and educational lines. To make this service most valuable to the public there is required the active cooperation of a large number of intelligent observers. Large miasses of facts and figures should be collected and tabulated, and experts should give them careful study to find out what they mean. There is mighty little in any of the books to help us in the solution of the many intricate problems that perplex us. We must closely study the facts and question nature. The text-books of meteorological science are mainly in the fields, groves, forests, and on the mountain tops. All the elements are vocal with instruction; the revolving old earth and the great dome of the sky above are thickly set with object lessons for our study.

OBSERVATIONS AT HONOLULU.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

Pressure is corrected for temperature and reduced to sea level, but the gravity correction, —0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations daily.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 10. Two directions of wind, connected by a dash, indicate change from one to the other; also same for force.

The rainfall for twenty-four hours is given as measured at 6 a. m. on the respective dates.

November, 1895.	Pressure at sea level.			Temperature.					Humidty.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1..	30.10	29.99	30.09	76	81	78	82	75	60	64	6.7	ne.	5	4	0.10
2..	30.12	30.02	30.08	76	80	77	82	73	64	71	6.9	ne.	5	5	0.05
3..	30.10	29.99	30.09	76	81	78	82	75	60	64	6.7	ne.	5-6	4	0.10
4..	30.10	29.99	30.04	76	80	77	81	74	68	67	6.8	ne.	4	4	0.06
5..	30.04	29.96	30.02	75	79	75	82	74	64	74	6.8	ne.	3	5	0.00
6..	30.03	29.96	30.04	66	79	72	81	66	68	90	7.1	ene.	3	5	0.35
7..	30.07	30.00	30.09	72	79	78	80	70	67	68	7.0	ne.	5	5	0.28
8..	30.15	30.05	30.16	75	78	77	79	74	60	68	6.4	nne.	5-6	6	0.17
9..	30.18	30.09	30.16	72	78	77	79	74	77	68	7.0	ene.	6	7	0.15
10..	30.17	30.05	30.13	75	80	76	80	74	64	74	6.8	ene.	6	6	0.10
11..	30.14	30.04	30.08	74	80	75	81	73	71	77	7.0	ne.	5	4	0.03
12..	30.09	30.02	30.08	70	81	74	84	68	75	80	7.6	wsw.	1	3-6	0.09
13..	30.06	29.98	30.05	70	79	76	82	69	77	81	8.0	sw.	1	3-7	0.00
14..	30.00	29.90	29.94	76	78	76	82	75	80	91	8.5	sw.	3	5-10	0.02
15..	29.96	29.92	30.00	71	74	71	75	69	92	68	6.8	sw-n	1-4	10-3	1.50
16..	29.98	29.88	29.94	66	72	65	74	65	56	79	5.1	n.	1	3	0.03
17..	29.92	29.82	29.89	61	70	69	71	59	95	76	5.9	ne-se.	2	10-6	0.60
18..	29.87	29.76	29.79	69	77	67	78	66	81	85	6.6	se.	2	4	0.59
19..	29.80	29.75	29.81	68	78	65	79	63	70	88	6.5	sw.	2	3	0.06
20..	29.87	29.83	29.92	67	76	65	78	65	74	83	6.5	n.	2	9	0.00
21..	29.99	29.93	30.00	65	76	71	78	65	65	64	5.7	nne.	3	3-0	0.00
22..	30.02	29.98	30.05	63	77	66	79	61	70	87	5.9	s.	1	3	0.00
23..	30.10	30.00	30.09	63	78	67	78	62	69	85	6.0	n-s.	1	0-3-0	0.00
24..	30.12	30.03	30.10	63	77	67	80	63	70	85	6.2	sw-n.	1-0	1-0	0.00
25..	30.13	30.03	30.13	63	79	74	80	63	64	74	6.5	*	2	1	0.00
26..	30.12	30.04	30.12	73	73	70	79	72	70	80	7.0	*	2-0	2-10-2	0.00
27..	30.11	30.04	30.12	66	79	75	85	62	74	74	6.8	*	1	2	0.16
28..	30.12	30.05	30.12	66	79	71	84	66	75	87	7.2	*	1-0	1-0	0.00
29..	30.13	30.04	30.11	66	80	70	82	65	72	90	7.1	*	1	2-4	0.00
30..	30.11	30.01	30.10	66	78	65	80	65	74	75	6.3	*	2	1	0.01
	30.05	29.97	30.04	69.3	77.9	72.1	78.8	68.3	70.5	87.6	6.7	.....	.....	.....	4.36

Mean temperature: 6+2+9+3 is 73.1; the normal is 74.1; extreme temperatures, 85° and 59°.

*Omitted from original report.

Meteorological observations at Honolulu, Republic of Hawaii, by Curtis J. Lyons, Meteorologist to the Government Survey.

December, 1895.	Pressure at sea level.			Temperature.					Humidity.			Wind.		Cloudiness.	Rain measured at 6 a. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Maximum.	Minimum.	Relative. 9 a. m.	Relative. 9 p. m.	Absolute.	Direction.	Force.		
	Ins.	*Ins.*	*Ins.*	°	°	°	°	°	%	%					*Ins.*
1..	30.13	30.04	30.12	60	75	70	77	59	53	64	5.1	nne.	1	1	0.00
2..	30.13	30.07	30.15	66	75	72	76	66	61	69	5.9	nne.	2	8	0.00
3..	30.16	30.08	30.13	67	76	73	78	67	67	65	5.9	ne.	3	6	0.01
4..	30.12	30.03	30.09	73	78	75	80	71	56	66	6.0	ne.	3	4	0.00
5..	30.10	30.01	30.07	71	78	70	81	70	70	80	6.6	ene-s.	2-0	1	0.00
6..	30.08	29.99	30.08	62	77	71	80	62	74	74	6.1	n-s.	1	2	0.00
7..	30.07	29.98	30.06	63	77	69	79	63	70	80	6.2	s-n.	1	2-9	0.00
8..	30.04	29.94	30.01	65	77	69	78	63	69	81	6.3	s-ne-sw	2-0	4	0.00
9..	30.00	29.92	30.01	65	77	71	79	64	77	81	6.4	w-sw.	1	3	0.00
10..	30.01	29.93	30.01	66	77	68	79	64	73	86	6.6	sw.	1	3	0.00
11..	30.02	29.93	30.02	67	80	74	80	66	74	83	7.5	sw.	1	4	0.01
12..	30.06	29.97	30.14	68	71	68	71	68	94	95	7.5	s-e-w.	1-0	10	1.30
13..	30.11	30.03	30.05	74	73	69	79	65	80	95	7.3	ne-n-s.	1-0	10	6.15
14..	30.05	29.98	30.05	68	76	72	76	67	91	77	7.1	se.	1	9	0.72
15..	30.07	29.99	30.07	72	78	73	79	67	81	78	7.2	e-ne.	1-3	5	0.00
16..	30.06	29.97	30.04	74	76	73	78	72	70	70	6.5	ne.	3	5-1	0.08
17..	30.04	29.94	29.97	65	76	73	78	65	79	74	6.7	ne.	1	7	0.02
18..	29.96	29.91	29.97	67	78	75	81	66	77	77	7.1	ene.	3	4	0.00
19..	30.03	29.99	30.07	74	78	76	79	73	68	70	6.7	ne.	2-5	7	0.00
20..	30.14	30.04	30.12	74	78	74	78	72	70	81	6.9	nne-ene	1-4	5	0.02
21..	30.08	29.96	30.03	73	77	71	78	73	70	85	6.4	ene.	4-2	3-9	0.04
22..	30.02	29.93	29.99	66	77	69	78	66	72	86	7.1	e-s.	1	5-7	0.08
23..	30.03	29.94	30.01	68	78	68	80	67	81	81	6.8	sw-e.	1	3	0.00
24..	30.05	29.97	30.04	66	77	74	79	64	70	70	6.6	nne.	2-5	7-3	0.00
25..	30.05	29.99	30.08	72	76	73	77	71	74	60	6.2	ne.	5-3	5-2	0.00
26..	30.06	29.98	30.05	73	76	73	78	71	67	69	6.1	ne.	4	2	0.02
27..	30.04	29.97	30.04	72	77	73	78	71	70	78	6.8	ne.	4	4	0.00
28..	30.05	29.95	30.00	73	76	73	78	72	70	74	6.6	ne.	3-5	5	0.09
29..	29.96	29.86	29.93	72	77	69	78	72	70	92	7.0	e-s.	1	2-10	0.07
30..	29.86	29.76	29.78	65	76	71	79	65	80	94	7.5	n-s-e-se	4-0	4-10	0.00
31..	29.78	29.74	29.85	70	77	70	79	68	81	80	7.4	sw-w.	3-1	3	3.92
	30.04	29.96	30.03	68.7	76.6	71.6	78.3	67.5	....	....	.....	.....	2.0	4.9	12.43

The monthly summary for December is: Mean temperature, 6+2+9÷3 is 72.3; extreme temperatures, 81° and 59°.

A thunderstorm occurred on the 30th at night.

THUNDER AND LIGHTNING IN DECEMBER.

Mr. John Butterworth, voluntary observer at Detroit, Oreg., writes as follows:

At 12.05 p. m., December 23, while in the midst of a driving snowstorm at Niagara, we were astonished to see a vivid and long-continued flash of lightning, followed quickly by a long and loud peal of thunder. As thunder in Oregon is unusual its occurence in connection with a snowstorm is worthy of record.

Mr. C. Scholz, voluntary observer at Mammoth, Kanawha Co., W. Va., writes that a terrible storm passed over that place between 4.15 and 6 p. m. of December 26; winds of hurricane force doing great damage to timber; lightning observed in the southwest, followed by thunder; snow from 7 p. m. to 9 p. m., after which it cleared up, followed by heavy frost.

FROSTS IN SOUTHERN CALIFORNIA.

Attention has been called to the statement made in the MONTHLY WEATHER REVIEW for September, 1895, page 341, on the authority of Mr. James Boyd, of Riverside, Cal., to the effect that "as a matter of fact the thermometer has seldom been known to fall between sunset and sunrise more than 10° in a cold wave, or from 7 to 8 o'clock at night to the same hour next morning." It seems that this statement represents a popular belief in that section of the country and, that relying upon its truth, many agriculturists are liable to feel at ease in regard to their crops, and omit to take precautions against frost when there is really more danger than they apprehend. In order to give more precise information on this subject the Editor has examined the meteorological records for Riverside, as furnished by our voluntary observer, Dr. F. M. Gardner, beginning with November, 1894, when records for 9 p. m. (Pacific time) as well as the maximum and minimum began to be reported. A table giving the fall from the maximum of the afternoon to the minimum of the following morning shows that the diurnal range may, in extreme cases, be as large as 60°, and is rarely lower than 10°. Of course, the greater part of this fall occurs in the afternoon. The fall